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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/888,365	06/22/2001	Stephen DeOrnellas	TEGL-01092US1	8894

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/02/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/888,365

Applicant(s)

DEORNELLAS ET AL.

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-16, 19, 30, 31 and 56-63 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-16, 19, 30, 31 and 56-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3-12-03 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-13, 15, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Imai et al., WO 97/27622.

Imai et al. shows the invention as claimed including a method of operating an etch reactor which comprises a reactor chamber 7, an upper electrode 5, a heater 11 that heats said upper electrode, and gas inlets and outlets comprising: introducing process gas into said chamber 7, and heating the upper electrode with said heater 11 to a temperature such that any material resulting from the reaction deposited on the

surface of the upper electrode forms a stable film comprising halogen elements (see fig. 1 and abstract).

With respect to claim 30, note that in Imai et al. a silicon oxide film is etched which is a non-volatile material.

Claims 12-13, 15, 30, and 56-61 are rejected under 35 U.S.C. 102(b) as being anticipated by Collins et al., U.S. Patent 5,556,501.

Collins et al. shows the invention as claimed including a method of operating an etch reactor which comprises a reactor chamber 16B, an upper electrode 17S with power applied thereto from a RF source 40, a heater that heats said upper electrode (see col. 7-lines 45-50), and gas inlets and outlets comprising: introducing process gas into said chamber 16B, and heating the upper electrode with said heater to a temperature such that any material resulting from the reaction deposited on the surface of the upper electrode forms a stable film comprising halogen elements (see fig. 1 and its description).

With respect to claim 30, note that a variety of materials including non-volatile materials can be etched in Collins et al. (see col. 6-lines 18-30).

Regarding claim 56, note that in an alternative embodiment a side electrode is formed from the walls which are heated (see col. 21-line 43 to col. 22-line 43).

With respect to claims 60-61, note that inherently any gas collected on the upper surface will desorb or boil off from the surface as a result of heating of these surfaces.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al., WO 97/27622.

Imai et al. is applied as above but fails to expressly disclose heating the upper electrode to a temperature of about 300 Celsius to about 500 Celsius. However, a prima facie case of obviousness still exists because generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the

prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al., U.S. Patent 5,556,501.

Collins et al. is applied as above but fails to expressly disclose heating the upper electrode to a temperature of about 300 Celsius to about 500 Celsius. However, a prima facie case of obviousness still exists because generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 16, 19, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al., U.S. Patent 5,556,501 in view of DeOrnellas et al., WO 99/25568.

Collins et al. is applied as above but fails to expressly disclose a platinum etch method or where oxygen and chlorine are present in the reactor and heating the upper electrode causes deposits of oxygen and chlorine to de-absorb from the upper electrode in order to leave mostly platinum deposited on the surface, or etching one of the materials exemplified in claim 31. However, it should be noted that Collins et al.

discloses that the apparatus of fig. 1 can be used to etch a variety of materials including etching metals (see col. 6-line 28). DeOrnellas et al. discloses a similar three electrode configuration as in Collins et al. (see fig. 7) where platinum or other materials such as those listed in claim 31 are etched in a chlorine gas and oxygen is inherently present in the chamber (see page 8, line 25 to page 9, line 17). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Collins et al. so as to performing the platinum etching process of DeOrnellas et al. because this would be a suitable method, for example, to reduce the platinum deposits that can form on the wafer.

Claims 16, 19, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al., WO 97/27622 in view of DeOrnellas et al., WO 99/25568.

Imai et al. is applied as above but fails to expressly disclose a platinum etch method or where oxygen and chlorine are present in the reactor and heating the upper electrode causes deposits of oxygen and chlorine to de-absorb from the upper electrode in order to leave mostly platinum deposited on the surface, or etching one of the materials exemplified in claim 31. DeOrnellas et al. discloses a where platinum or other materials such as those listed in claim 31 are etched in a chlorine gas and oxygen is inherently present in the chamber (see page 8, line 25 to page 9, line 17). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Imai et al. so as to perform the

platinum etching process of DeOrnellas et al. because this would be a suitable method, for example, to reduce the platinum deposits that can form on the wafer.

Claims 16, 19, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al., U.S. Patent 5,556,501 in view of Keizo, JP 07-130712A.

Collins et al. is applied as above but fails to expressly disclose a platinum etch method or where oxygen and chlorine are present in the reactor and heating the upper electrode causes deposits of oxygen and chlorine to de-absorb from the upper electrode in order to leave mostly platinum deposited on the surface. However, it should be noted that Collins et al. discloses that the apparatus of fig. 1 can be used to etch a variety of materials including etching metals (see col. 6-line 28). Keizo discloses performing plasma etching of platinum using a chloride containing gas (see abstract). Furthermore, note that inherently oxygen will be present in the chamber. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Collins et al. so as to performing the platinum etching process of Keizo et al. because this would be a suitable method, for example, to reduce the platinum deposits that can form on the wafer.

Claims 16, 19, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al., WO 97/27622 in view of Keizo, JP 07-130712A.

Imai et al. is applied as above but fails to expressly disclose a platinum etch method or where oxygen and chlorine are present in the reactor and heating the upper electrode causes deposits of oxygen and chlorine to de-absorb from the upper electrode in order to leave mostly platinum deposited on the surface. Keizo discloses performing plasma etching of platinum using a chloride containing gas (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Imai et al. so as to perform the platinum etching process of Keizo because this would be a suitable method, for example, to reduce the platinum deposits that can form on the wafer.

Claims 56-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al., WO 97/27622 in view of Collins et al., U.S. Patent 5,556,501.

Imai et al. is applied as above but fails to expressly disclose providing power to the upper electrode and a three electrode structure with a side electrode which is heated. Collins et al. discloses an upper electrode 17S with power applied thereto from a RF source 40 and an alternative embodiment in which a side electrode is formed from the walls which are heated (see col. 21-line 43 to col. 22-line 43). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Imai et al. so as to provide power to the upper electrode and use a three electrode structure as disclosed by Collins et al. because providing power to the upper electrode allows for the flexibility of both inductive

and capacitive coupling during the etching process and the three electrode process allows for additional process control and enhancement (see col. 21-lines 44-46).

With respect to claims 60-61, note that inherently any gas collected on the upper surface will desorb or boil off from the surface as a result of heating of these surfaces.

Claims 62-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al., WO 97/27622 in view of Yamazaki et al., U.S. Patent 6,001,432.

Imai et al. is applied as above but fails to expressly disclose the upper electrode having an electrode shield formed thereon. Yamazaki et al. discloses a plasma apparatus where an electrode shield 4 is formed on an upper electrode 3 (see fig. 1, for example, and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Imai et al. so as to form an electrode shield on the upper electrode because this will protect the upper electrode itself from exposure to the plasma.

Claims 62-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Collins et al., U.S. Patent 5,556,501 in view of Yamazaki et al., U.S. Patent 6,001,432.

Collins et al. is applied as above but fails to expressly disclose the upper electrode having an electrode shield formed thereon. Yamazaki et al. discloses a plasma apparatus where an electrode shield 4 is formed on an upper electrode 3 (see fig. 1, for example, and its description). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify

the process of Collins et al. so as to form an electrode shield on the upper electrode because this will protect the upper electrode itself from exposure to the plasma.

Response to Arguments

Applicant's arguments with respect to claims 12-16, 19, 30-31, and 56-63 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Imai et al., U.S. Patent 6,214,740, is the US equivalent of WO 97/27622.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

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May 30, 2003

A handwritten signature in black ink, appearing to read "Alejandro", written in a cursive style.

Luz L. Alejandro
Primary Examiner
Art Unit 1763